

Weekly report (2012.7.9~7.15)

Done

- 1) I spent most of this week getting my driving license, and finally passed the final exam on Saturday.
- 2) After the discussion with prof. Zhang this Wednesday, we come up with a new idea. Although I'm not sure it's a good idea, after my experiment, this idea turns out to speed up my implementation upon apsara.

Idea Description:

In the former implementation, the mapper rasterized each triangle and emit the key-value pair where key is the position of the pixel at the final picture, and value is the color and depth of the pixel. After map step finished, reduce get the sorted pixels and produced the final picture. As we can see, there exists a large data flow from map step to reduce step because there is so much pixels. So, this may become a bottle neck. As a solution, we divide the implementation into 2 steps, first we split the scene into segments, the mapper get each triangle and decide which segment it belongs to, then emit the key-value pair where key is the segment number and the value is the information such as color, depth and projected position, of the triangles. At the reduce step, we turn each segment into a separated scene. Secondly, we just need to render segments use another map-reduce, as these segments are all separated, it may be rather fast. Because we transfer the info of the triangles instead of the pixels from map to reduce, the size of the internal data will be reduced, so the bottle neck is solved.

Experiment result:

I have implemented the first step so far, and the result is shown in Figure 1 and Figure 2, the experiment is done upon a apsara cluster with 3 working nodes. As we can see, the cost of the worker, especially the reduce worker, is significantly decreased.

Figure 1 experiment result

	Former implementation	New implementation(first step)
Input	103.8M triangles	
Output	20480*25360 (0.3G)	
Map worker	3600	
Reduce worker	100	
Per map time (max)	0:02:12	0:00:19
Per reduce time (max)	0:38:49	0:00:18

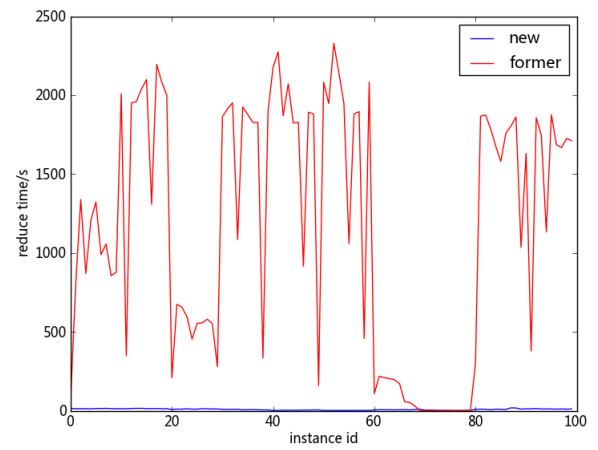
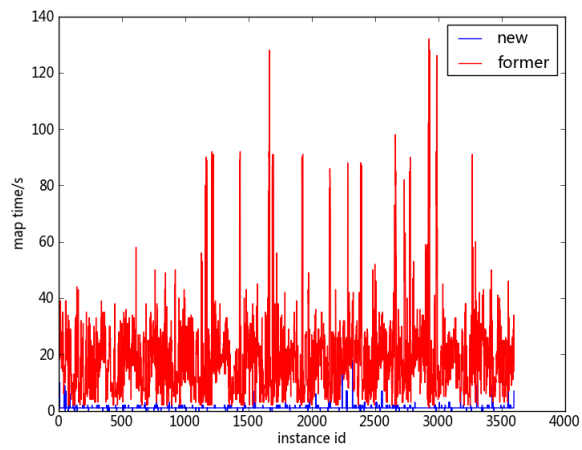


Figure 2 map, reduce time compare

To Do Next and Next Next Week

- 1) On my vacation.